



Strategic Planning for Transportation for the Nation (TFTN)

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June 8, 2011



Background

Influenced by several different efforts:

- In 2008, an “issues brief” by NSGIC called for the creation of TFTN
- OMB Circular A-16 identifies the USDOT as the “lead agency” for the “transportation theme” of the National Spatial Data Infrastructure (NSDI).
- Emerging USDOT data requirements for geospatial data for all roads, such as accident reporting for enhanced safety and bridge inventory.
- Aligned with several initiatives such the emerging federal Geospatial Platform concept. - one element of the “geospatial portfolio”

TFTN Concept

“Creation and maintenance of high-quality, nationwide transportation data that is in the public domain”

- An **initial focus on street centerlines**, but eventually multi-modal
- **Nationwide** data spanning all states and territories
- **All roads**, not just Federally funded roads
- Provides a **common geometric baseline**
 - Road naming
 - Persistent segment ID numbering
 - Advanced functionality is built on top of baseline
- Data is in the **public domain** and readily **shareable**

Project Governance

- USDOT/RITA Project Management
 - Advisory input from NSGIC
- Consulting Team: Koniag Technology Solutions & Applied Geographics
- Steering Committee
 - Executive Members (7)
 - At-Large Members (36)
- Project Website: <http://www.tftn.org/>

Strategic Planning Effort – What We Did

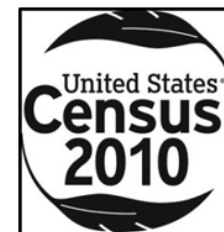
- Identify and engage stakeholders
- Define requirements, challenges and opportunities
- Document progress already made
 - Existing Datasets
 - Best Practices
 - New Ideas
- Explore implementation issues
- Evaluate funding sources



Stakeholder Outreach Interviews



- Safety
- FHWA Highway Performance Management System
- Intelligent Transportation Systems
- Asset Management



Stakeholder Outreach Presentations & Workshops



Transportation Research Board
89th Annual Meeting
January 10-14, 2010
Washington, D.C.

NSGIC 2010 Midyear Conference
"A Collaborative Heading"
March 7-10, 2010
Loews Annapolis Hotel
Annapolis, MD



**ESRI International
User Conference**

Join us July 12-16, 2010 at the
San Diego Convention Center

Transportation Research Board
90th Annual Meeting
January 23-27, 2011 • Washington, D.C.



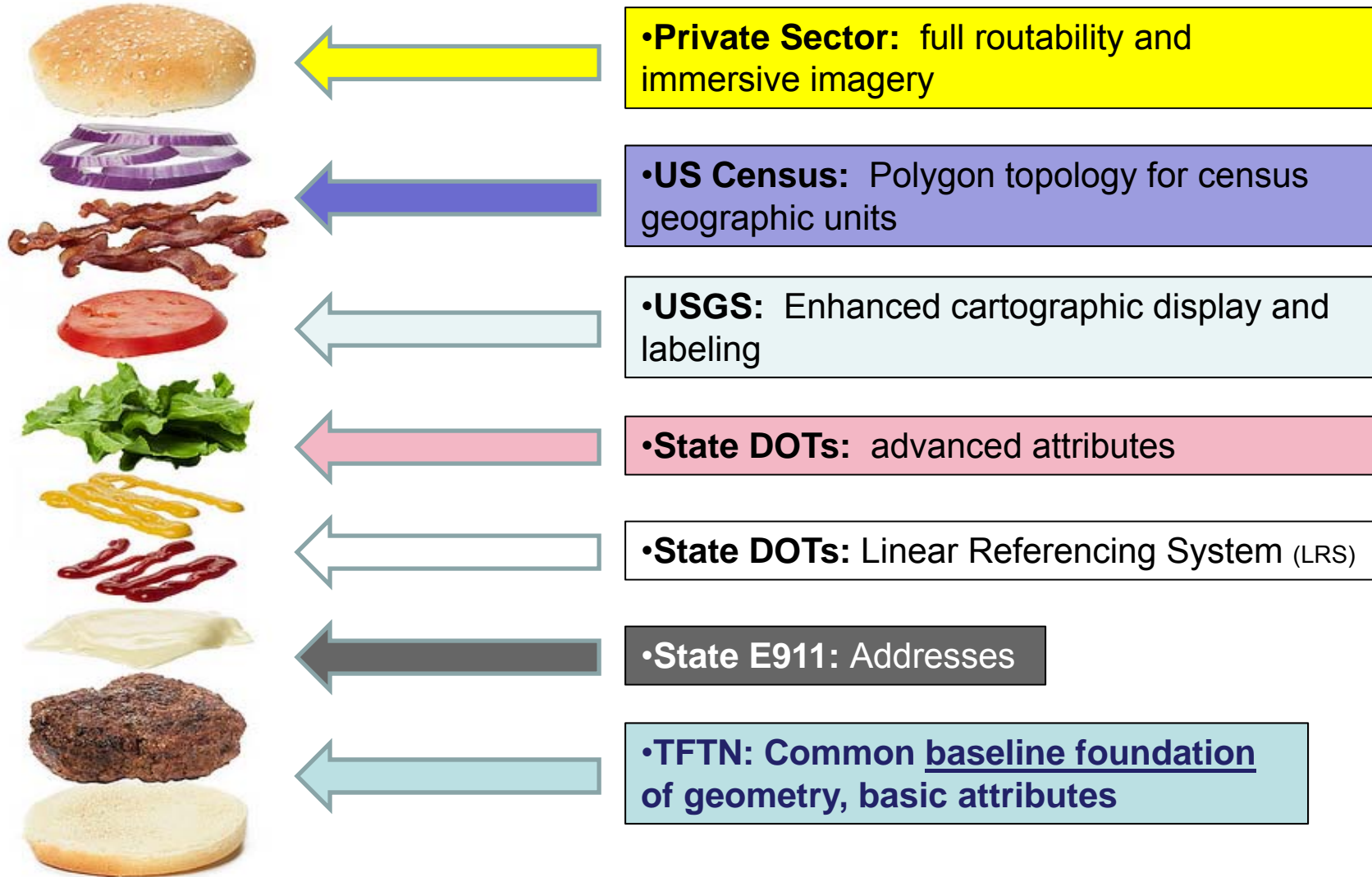
Trends from the Workshops and Interviews

- Near Unanimous Support
 - All of those interviewed and most of those who attended the workshops have indicated their support for this effort
- Learned of a number of similar efforts underway that benefit from TFTN
- Safety could be a key to the success of TFTN
 - USDOT goal to greatly reduce the number of fatal accidents
 - A geospatial representation of ALL ROADS is needed to meet many of the USDOTs Safety Initiatives
 - A geospatial representation of ALL ROADS is needed for emergency response
 - Lots of federal money for safety initiatives

Baseline Geometry with “Special Sauce”

- The specifics of what’s included in “baseline geometry” requires further definition
- Initial, **minimal components** might be:
 - Road naming
 - Basic attributes (e.g. functional classification)
 - Persistent segment ID numbering
- Seeking additional ideas and input from stakeholders on what’s feasible
- “Special sauce” can be content and/or capabilities

Variety of stakeholders adds their own “special sauce” on top



Existing Nationwide Road Centerlines

- The following three alternatives were examined in terms of **pros and cons**:
 - US Census TIGER Data
 - Commercial Data Providers
 - NAVTEQ
 - TomTom
 - Volunteered Geographic Information (VGI)
 - OpenStreetMap (OSM)
 - ESRI's Community Base Maps (ECBM)

ALL ARE LESS THAN IDEAL FOR TFTN “AS IS”



The Model for TFTN - HPMS

- FHWA reporting requirements for the Highway Performance Monitoring System (HPMS) include the submission of a geospatial network of all **Federal-aid roads** by each State DOT
- Current reporting requirements for the HPMS could be expanded to require all roads
 - Detailed HPMS attributes would continue to be provided for only Federal-aid roads
 - Annual nature of HPMS reporting provides a **data update mechanism**
 - USDOT works with states to develop basic standards
 - Reporting requirement would **enable states to utilize FHWA funding** for creation and maintenance of inventory



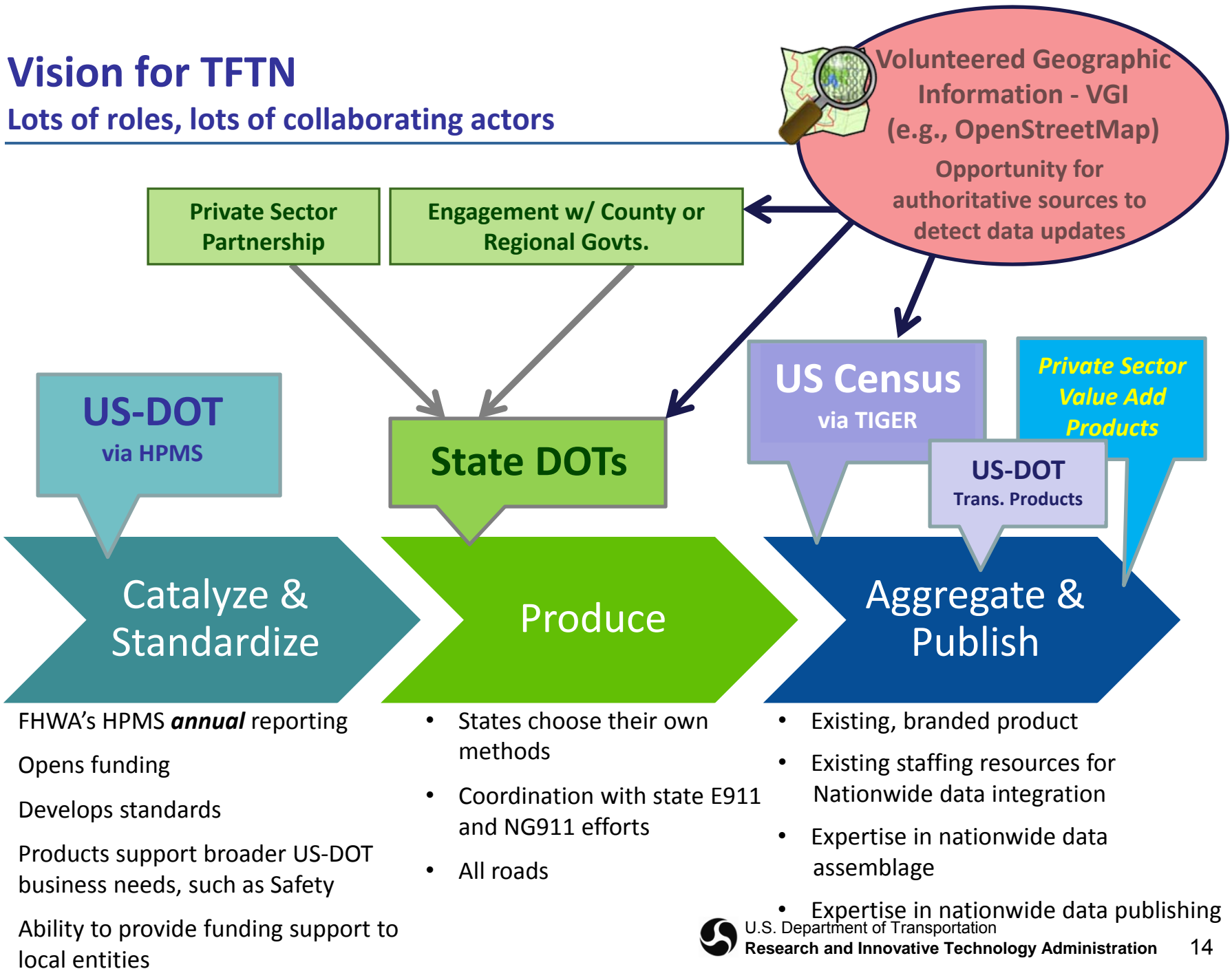
Obstacles Associated With This Model

- FHWA has to change the HPMS Reporting Requirements to include all roads in the geospatial submission
- States are not required to work with neighbors for connectivity
- No USDOT resources currently available for aggregation, assembly and publication of a nationwide data set
- The level of quality/accuracy varies from State to State
- Although there is general agreement that the state DOTs are the authoritative source for street centerlines for their respective jurisdictions, there is very little independent verification of their accuracy



Vision for TFTN

Lots of roles, lots of collaborating actors



TFTN Strategic Plan Status

- TFTN Strategic Plan will be out after Steering Committee (Exec-Com & At-Large) review of Draft
 - Strategic Plan document is written
 - Initial review completed by USDOT (late March)
 - Exec-Com review completed (mid April)
 - Released to At-Large Committee (late May)
 - Distributed to FGDC CG and NGAC (late May)
 - Public release on TFTN.ORG soon!



Case Studies Outline

1. **OH:** Example of [state activating counties](#)
2. **NY:** Example of [state-private sector partnership](#) for centerlines
3. **MI:** Example of a [state GIS office](#) assisting a state DOT
4. **KY:** Statewide, [multi-purpose centerline](#) used for HPMS, E-911, etc.
5. **VA Counties:** Example of [multiple counties](#) collaborating for centerlines
6. **WA Pooled Funds Study:** Example of a [multi-state, regional data collection and integration effort](#)
7. **I-95 Corridor Study:** Example of [multi-state data integration and update challenges](#)



Ohio: Collaboration on Street Centerlines

- The Location Based Response System (LBRS) is a **partnership between state and local government** to develop:
 - Highly-accurate (+/- 1 m), field-verified street centerlines
 - Address point locations for the entire state
- The state has developed a set of standards and provides financial incentive to counties through a Memorandum of Agreement (MOA) to provide funds
- This effort has resulted in the successful culmination of **many organizations working together to provide accurate centerline data throughout the state** for use by:
 - Emergency response organizations
 - State geospatial programs



New York: Multi-purpose Centerline Outlook and Involvement from the State GIS Office

- In the late 1990s, New York State launched a **statewide baseline mapping program** utilizing GIS to upgrade how the New York DOT/DMV maintained their road data
 - Conform to the new state standard
 - Focus on Federal regulations from such program as the FHWA Highway Performance Monitoring System (HPMS).
- With a **single street centerline layer**, other agencies will be able to consume this data
 - Support multiple applications
 - Support county and local government
- A web portal where counties can upload/download data was created. The data is verified, incorporated in to the working set and then disseminated back to State and other entities such as NAVTEQ.



Michigan: State GIS office Assists the Michigan DOT

- The Michigan State GIS office is currently undergoing an effort called the **Transportation Data Stewardship Enhancement Plan**
- The program utilizes five full time staff members who work constantly to maintain the data
- Because of the strict nature and use of the State data model, it has been reported that **the State's submission to HPMS has had no errors over the past several years**
- The **Michigan State GIS office has assembled a robust and accurate road centerline** that covers a majority of the State



Kentucky: Linkage of the Transportation Centerline to HPMS, other route-dependent datasets and E-911

- In the late 1990's the **Kentucky State Public Centerline project** was originally conceived as the brainchild of Greg Witt from the Kentucky Department of Transportation (KDOT), to:
 - Derive better statistical information and analytical products from all of the centerline data for the State
 - Move the State's geospatial data infrastructure into a geographic information system (GIS) powered by LRS
- Tremendous effort was put forth for funding to contract with **Area Development Districts (ADDs) from around the State** for data:
 - Foundation data layer that could be used by other agencies within the state, the Federal Highway Administration (FHWA), and the general public
 - These data also represent data sources that would not otherwise be available statewide without a high level of collaboration between all stakeholders within the State
- The resulting efforts have made for **seamless submission to HPMS** and help to enhance its performance and accuracy



Virginia: Northern Virginia Regional Routable Centerline

- **Five Public Safety Answering Points (PSAPs)** in the Northern Virginia area, the Virginia Information Technology Agency (VITA), and the Virginia Department of Transportation (VDOT) working in collaboration, to:
 - Develop a routable road centerline data set and standard usable by **Computer-Aided Dispatch** (CAD) systems.
 - Enhance VGIN Road Centerlines (RCL) for supporting routing, geocoding, and persistent updates to local 911 map systems. It will
 - Support each individual CAD system for data outside their own jurisdiction (while not forcing them to change the data model currently used in CAD)
- The VGIN RCL project is considered a huge local success because of the **communication and handshaking that occurs between the state GIS and the state DOT**
 - Will eventually have a seamless flow from participating cities and counties up to the state and then back again to complete the round trip
 - Additional work on the project includes the development of maintenance tools and the integration of regional data into CAD systems



Washington Pooled Funds: Example of a Multi-State, Regional Effort to Collect and Integrate Transportation Data

- The Washington State Transportation Framework project (WA-Trans) is to **build a framework transportation data layer in collaboration with all levels of government**, including:
 - 8 Federal Agencies, 7 States, 14 Washington State agencies, 23 counties, 10 cities, 9 tribal governments, and 20 other private and public entities
- **WA-Trans has been working in cooperation with six other state DOTs** to develop computer-based tools that facilitate transportation data sharing and integration financed with federal funds, specifically Transportation Pooled Funds (TPF)
- **Executed at the state level with data collected from a local level**, integrated at a state level, and shared to all project participants
- This collaborative collection of data plays a vital role in a **Statewide Transportation Framework**



I-95 Corridor: Example of Multi-State Data Integration

- In support of the I-95 Corridor Coalition, Cambridge Systematics is coordinating the **development of a corridor-wide information system**
 - **Consolidates existing state roadway network databases into a single multi-state roadway network** to guide regional transportation planning and emergency management efforts
- The individual **state roadway databases are ‘stitched together’ at the state borders to form a topologically integrated network**
 - Many variations in data contents and consistency for road datasets were encountered from state-to-state
 - Generally, useful and reasonably accurate road features were available to produce a public domain road network for the Corridor
- Conclusion: It might be easier to use a stripped down commercial roadway centerline network as a framework
- The issue would be ensuring public domain accessibility, with no license restrictions to inhibit use



In Summary

- We've made it this far, and have a final draft **Strategic Plan**; a more detailed Business Plan is next
- **Input from Stakeholders** has been useful and essential
- Initially, we're **focused on road centerlines**; eventually, other modes
- We concluded that **existing nationwide road centerlines are not adequate for TFTN** requirements in their current "as is" condition or form
- The main recommendation is to **build on FHWA's HPMS program**, and take a new approach consistent with USDOT's responsibility as the lead federal agency for the **Transportation Theme of NSDI**
- Case studies indicate there are a **number of working models at the grassroots level**



The Road Ahead

- Public release of a final strategic plan
- Move on to the Business Plan
 - Identify cost and funding
 - More detailed design, prototyping & business case
- Begin implementation during 2012



Questions/Comments?

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<http://www.tftn.org>

